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NATIONAL MARINE FISHERIES SERVICE
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CRUISE REPORT

NOAA R/V JOHN N. COBB
Cruise No. JC-88-01
5 - 26 March 1988

Longline gear experiments in 1986 and 1987 by the Northwest and Alaska Fisheries Center established gear configuration and sampling methods for the domestic longline survey that was conducted in the Gulf of Alaska in 1987. The experiments included the effect of soak time and competition for hooks on sablefish Anoplopoma fimbria catch rates, as well as a comparison of catches of sablefish in gullies and adjacent slope areas. The present experiment focused on the effects of bait, soak time, and gangion type on catch rates of sablefish. This report summarizes the results of the present experiment. These results will be used in planning and execution of the 1988 domestic longline survey of the Gulf of Alaska.

On the March 1988 cruise of the R/V John N. Cobb, the effect of bait type and soak time on the sablefish catch rate was investigated. The hypothesis was that the sablefish catch rate is higher for hooks baited with squid compared to hooks baited with herring. It was additionally hypothesized that the catch rate for hooks baited with squid is markedly greater with increased soak time whereas the catch rate for hooks baited with herring is only slightly greater with increased soak time. The effect of gangion type on the sablefish catch rate also was investigated in March 1988. The hypothesis was that the sablefish catch rate is the same for both gangion types tested, No. 48 thread hard lay and No. 60 thread medium lay.

OBJECTIVES

1. Assess the effect of using either herring or squid for bait at 3 and 7 h soak times on sablefish catches using longline gear.

2. Assess the effect of gangion type (No. 48 thread hard lay versus No. 60 thread medium lay) on sablefish catches.

GEAR AND SAMPLING METHODS

Longline gear rigged with circle hooks was used. Each skate

was 366 m (200 fm) in length with 176 hooks attached. The groundline was 0.8 cm (5/16 in) leaded poly. Beckets spaced 2 m (6.5 ft) apart were tied into the groundline. A 38 cm (15 in) gangion was tied onto each becket, with an Eagle Claw 7/0 circle hook on the end of each gangion. The gangions were tied from 66 cm (26 in) sections of gangion material. Two types of gangion material were compared, No. 48 thread hard lay and No. 60 thread medium lay. The first 88 hooks on each skate were No. 48 thread hard lay and the second 88 hooks on each skate were No. 60 thread medium lay. The becket material was medium lay No. 60 thread.

Six skates of gear were set each day in sets of three skates. A lead line (groundline without hooks) 137 to 275 m (75 to 150 fm) in length was tied to each end of the set and was anchored with 31 to 40 kg (70 to 90 lb) of chain. Buoy lines were 0.8 cm (5/16 in) leaded poly. Buoy line length was 732 m (400 fm) [water depth was about 600 m (328 fm)]. Hooks were hand baited with chopped bait and set from circular plastic tubs, 46 cm (18 in) high by 61 cm (24 in) in diameter. Two types of bait were compared, herring and squid. Hooks were baited with herring at a rate of 5.2 kg (11.4 lb) per 100 hooks and with squid at a rate of 4.4 kg (9.8 lb) per 100 hooks.

SCIENTIFIC METHODS

Scientific operations were conducted in Chatham Strait near Funter Bay (Figure 1) and lasted from March 5-26, 1988. Two longline sets were made each day. One set soaked three hours and the other set soaked seven hours. Soak time equals the difference between the time setting of the longline ends and the time hauling of the longline begins.

Eight sites were sampled within the experimental area using a randomized block design. Four possible combinations of bait type and soak time were tested, herring 3 h, herring 7 h, squid 3 h, and squid 7 h. Each combination was tested at each site to account for the effect of site on the resultant catch rates. The order that the four combinations was tested at a site was systematically varied to account for the effect of sampling order on catch rate.

The time was recorded at the start of haulback, as the first hook came aboard, at the end of each 50 fathom length of groundline, and at the end of haulback. Catch by species was recorded. Baited and broken or tangled hooks were enumerated. A catch rate was calculated by species and was adjusted for tangled, missing, or broken hooks and gangions. Viable sablefish were tagged, marked with oxytetracycline, and released.

RESULTS

A sablefish catch rate was calculated for each set by gangion type. The average catch rates were 24.7 and 26.5% (catch

per 100 hooks) for the #48 thread hard lay gangion and the #60 thread medium gangion, respectively. The resultant catch rates by station and gangion type were compared using a paired t-test; there was no significant difference. Because there was no significant difference, the data was pooled across gangion type for the comparison of bait type and soak time.

A sablefish catch rate was calculated for each set, then averaged for each treatment combination. The average catch rate was 22.8, 28.5, 25.8, and 30.7% for herring 3 h, herring 7 h, squid 3 h, and squid 7 h, respectively (Figure 2). A preliminary statistical analysis indicated that the differences due to bait and also soak time were significant. One likely reason for the difference in the catch rates between the two bait types was the length of time the bait remained on the hook: 47.3 and 28.4% of the squid baits remained on the hooks after soaking 3 and 7 h, respectively, whereas only 24.7 and 7.2% of the herring baits remained on the hooks after soaking 3 and 7 h, respectively.

The higher catch rate for squid was expected based on a comparison of the catch rates of the 1987 domestic longline survey and the 1987 Japan-U.S. cooperative longline survey. The markedly higher catch rate for herring after 7 h compared to 3 h was not expected based on results of previous soak time experiments (Table 1). The relative increase in the catch rate due to soak time was the highest in this experiment compared to any of the three previous soak time experiments.

About 3,500 adult sablefish were tagged, marked with oxytetracycline, and released at the experiment site. An additional 649 juvenile sablefish were tagged and released in Saint John Baptiste Bay, Baranof Island, Alaska. Twenty-three adult and 36 juvenile sablefish were brought back alive to NWAFC, Auke Bay Laboratory to be held and observed for oxytetracycline retention. Otoliths were taken from 50 juvenile sablefish in Saint John Baptiste Bay for studies by the NWAFC Age and Growth Task.

SCIENTIFIC PERSONNEL

5 - 13 March
Michael Sigler, Field Party Chief, NWAFC, Auke Bay Laboratory (ABL), Auke Bay, AK
Jeffrey Fujioka, NWAFC, ABL
Ellen Varosi, NWAFC, ABL
Allison Reak, NWAFC, Resource Ecology and Fisheries Management Division, Seattle, WA

14 - 18 March
Michael Sigler, Field Party Chief, NWAFC, ABL
Ellen Varosi, NWAFC, ABL
Jonathan Heifetz, NWAFC, ABL
Michele Masuda, NWAFC, ABL

19-26 March
Ellen Varosi, Field Party Chief, NWAFC, ABL
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For further information on R/V John N. Cobb Cruise 88-01, please contact:

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Table 1.--Sablefish catch rate from soak time experiments from 1986-88.

Area	Soak time (h) 3	7	Percent difference ((7-3)/3)*100
Chatham Strait, near Tenakee Inlet (21 - 25 May 1986)	36	38	+6
Icy Strait (28 June - 2 July 1986)	27	28	+5 4
Stikine Strait (17 - 31 May 1987)	16	18	+13
Chatham Strait, near Funter Bay (5 - 16 March 1988)	23	29	+25 26

Table 2.--Total catch by species.

Common name	Scientific name	Number
sablefish	Anoplopoma fimbria	4,201
Pacific halibut	Hippoglossus stenolepis	338[a]
arrowtooth flounder	Atherestes stomias	65
rockfish	Sebastes spp.	1
thornyheads	Sebastolobus spp.	36
skates	Rajidae	644
dogfish	Squalus acanthias	974
other spp.		11

[a] - One hundred seventy nine of the halibut were caught in two test sets in Icy Strait.

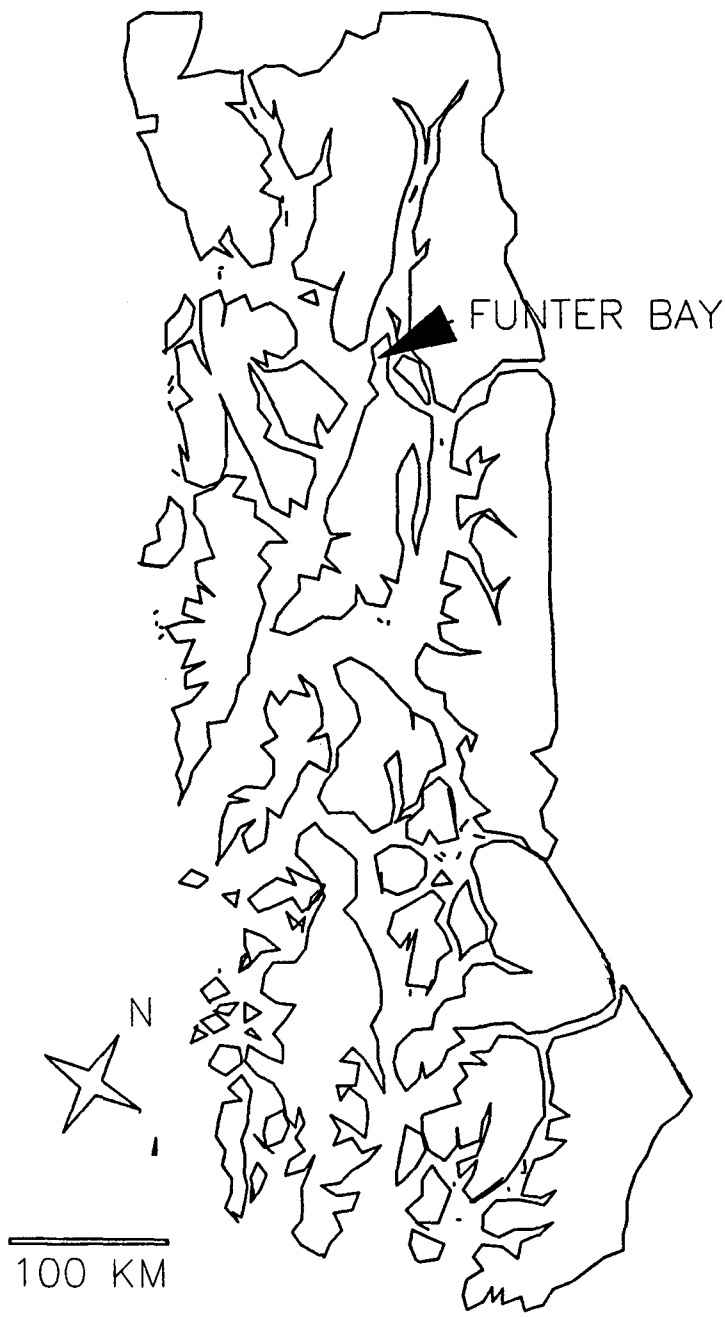

Figure 1.--Location of experimental area, Chatham Strait near Funter Bay.

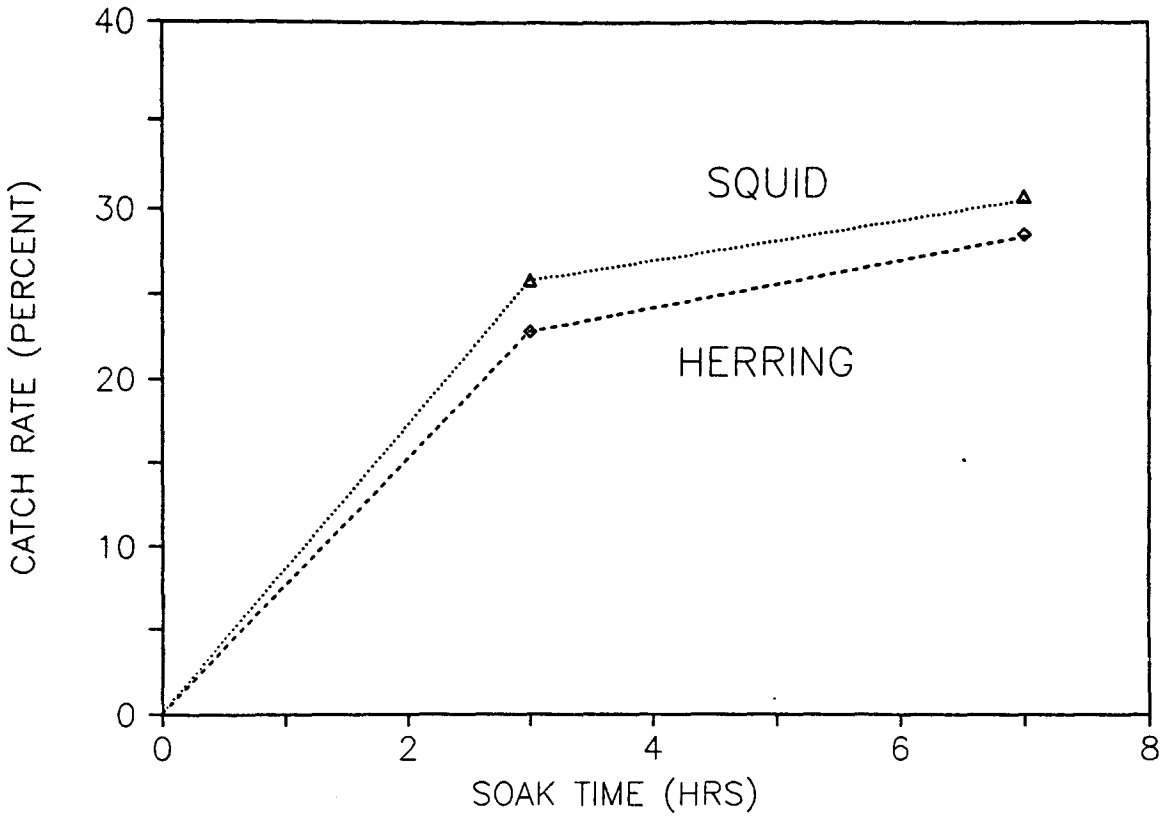

Figure 2.--Sablefish catch rate by bait type, herring or squid, and soak time, 3 hours or 7 hours. Cruise JC-88-01, 5 - 26 March 1988.